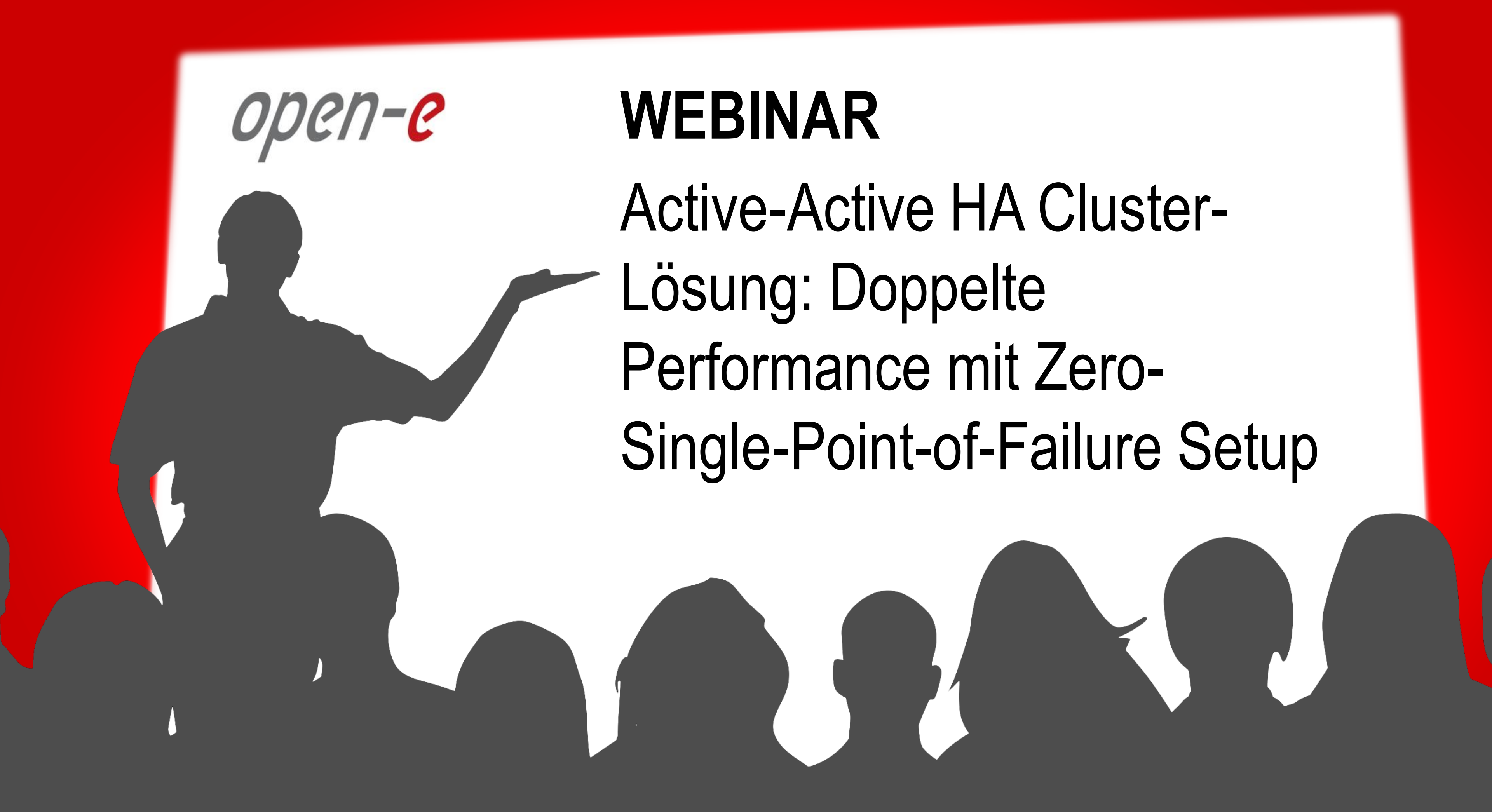


27 November, 2012

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Active-Active HA Cluster-Lösung: Doppelte Performance mit Zero-Single-Point-of-Failure Setup

- Test-Performance und Fehlersimulation mit Acitve-Active HA Cluster
- Beispiel: Optimales HA Cluster Setup
- Zusammenspiel von Bonding und Multipath
- Volume Replication mit 10Gb Ethernet oder Round-Robin Bonding
- Maximale Performance und Zero-Single-Point-of-Failure Setup

Open-E DSS V7 Active-Active iSCSI Failover



1. Hardware Configuration

Hardware Requirements:

To run the Active-Active iSCSI Failover, two DSS systems are required. Both servers must be located and working in the Local Area Network. See below configuration settings as an example:

PING NODES
IP Addresses : 192.168.2.7; 192.168.3.7

Xen
vmware
Hyper-V
LAN
Control
Switch 1
Switch 2

Data Server (DSS220)
node-a
IP Address:192.168.0.220

RAID System 1

- Port used for WEB GUI management — IP:192.168.0.220 — eth0
- Volume Replication, Auxiliary connection (Heartbeat) — IP:192.168.1.220 — eth1
- Storage Client Access, Auxiliary connection (Heartbeat) — IP:192.168.2.220 — eth2
- Storage Client Access, Auxiliary connection (Heartbeat) — IP:192.168.3.220 — eth3
- Volume Groups (vg00)
- iSCSI volumes (lv0000, lv0001)
- iSCSI targets

Data Server (DSS221)
node-b
IP Address:192.168.0.221

RAID System 2

- Port used for WEB GUI management — eth0 — IP:192.168.0.221
- Volume Replication, Auxiliary connection (Heartbeat) — eth1 — IP:192.168.1.221
- Storage Client Access, Auxiliary connection (Heartbeat) — eth2 — IP:192.168.2.221
- Storage Client Access, Auxiliary connection (Heartbeat) — eth3 — IP:192.168.3.221
- Volume Groups (vg00)
- iSCSI volumes (lv0000, lv0001)
- iSCSI targets

Note: It is strongly recommended to use direct point-to-point (without the switch) connection for the volume replication.

Virtual IP Address:
192.168.20.100 (resources pool node-a iSCSI Target0)

Virtual IP Address:
192.168.30.100 (resources pool node-b iSCSI Target1)

iSCSI Failover/Volume Replication (eth1)

NOTE:
To prevent switching loops, it's recommended to use RSTP (802.1w) or STP (802.1d) protocol on network switches used to build A-A Failover network topology.

Open-E DSS V7 Active-Active iSCSI Failover



Hardware Configuration with 2 IP virtual addresses on the single NIC

Xen
vmware
Hyper-V
LAN

PING NODES
IP Addresses : 192.168.2.7; 192.168.3.7

Control

Data Server (DSS220)
node-a
IP Address:192.168.0.220

Data Server (DSS221)
node-b
IP Address:192.168.0.221

Switch 1
Switch 2

RAID System 1

Port used for WEB GUI management
IP:192.168.0.220 eth0

Volume Replication, Auxiliary connection (Heartbeat)
IP:192.168.1.220 eth1

Storage Client Access, Auxiliary connection (Heartbeat)
IP:192.168.2.220 eth2

Volume Groups (vg00)
iSCSI volumes (lv0000, lv0001)
iSCSI targets

RAID System 2

Port used for WEB GUI management
eth0 IP:192.168.0.221

Volume Replication, Auxiliary connection (Heartbeat)
eth1 IP:192.168.1.221

Storage Client Access, Auxiliary connection (Heartbeat)
eth2 IP:192.168.2.221

Volume Groups (vg00)
iSCSI volumes (lv0000, lv0001)
iSCSI targets

Note:
It is strongly recommended to use direct point-to-point (without the switch) connection for the volume replication.

Virtual IP Address:
192.168.20.100 (resources pool node-a iSCSI Target0)

Virtual IP Address:
192.168.30.100 (resources pool node-b iSCSI Target1)

iSCSI Failover/Volume Replication (eth1)

NOTE:
To prevent switching loops, it's recommended to use RSTP (802.1w) or STP (802.1d) protocol on network switches used to build A-A Failover network topology.

Open-E DSS V7 Active-Active iSCSI Failover



Hardware Configuration with 2 IP virtual addresses on bond.

Xen
vmware
Hyper-V
LAN

PING NODE
IP Address : 192.168.2.7

Control

Data Server (DSS220)
node-a
IP Address:192.168.0.220

Data Server (DSS221)
node-b
IP Address:192.168.0.221

Switch 1

Switch 2

RAID System 1

Port used for WEB GUI management
IP:192.168.0.220 eth0

Volume Replication ,
Auxiliary connection (Heartbeat)
IP:192.168.1.220 eth1

Storage Client Access, Auxiliary connection (Heartbeat)
bond0 IP:192.168.2.220 (eth2, eth3)

Volume Groups (vg00)

iSCSI volumes (lv0000, lv0001)

iSCSI targets

RAID System 2

Port used for WEB GUI management
eth0 IP:192.168.0.221

Volume Replication ,
Auxiliary connection (Heartbeat)
eth1 IP:192.168.1.221

Storage Client Access, Auxiliary connection (Heartbeat)
(eth2, eth3) IP:192.168.2.221 bond0

Volume Groups (vg00)

iSCSI volumes (lv0000, lv0001)

iSCSI targets

Note: It is strongly recommended to use direct point-to-point (without the switch) connection for the volume replication.

Virtual IP Address:
192.168.20.100 (resources pool node-a iSCSI Target0)

Virtual IP Address:
192.168.30.100 (resources pool node-b iSCSI Target1)

iSCSI Failover/Volume Replication (eth1)

NOTE:
To prevent switching loops, it's recommended to use RSTP (802.1w) or STP (802.1d) protocol on network switches used to build A-A Failover network topology.

Open-E DSS V7 Active-Active iSCSI Failover



Multipath I/O with Activ-Activ iSCSI Failover.

Storage client

IP:192.168.10.231 eth0

IP:192.168.21.231
IP:192.168.22.231 eth2 (MPIO)

IP:192.168.31.231
IP:192.168.32.231 eth3 (MPIO)

PING NODES
IP Addresses : 192.168.12.107, 192.168.13.107

LAN

Control

Data Server (DSS1)
node-a
IP Address:192.168.10.220

Switch 1

Switch 2

Data Server (DSS2)
node-b
IP Address:192.168.10.221

RAID System 1

Port used for WEB GUI management
IP:192.168.10.220 eth0

Volume Replication ,
Auxiliary connection (Heartbeat)
IP:192.168.11.220 eth1

Storage Client Access, Multipath
Auxiliary connection (Heartbeat)
IP:192.168.12.220 eth2

Storage Client Access, Multipath
Auxiliary connection (Heartbeat)
IP:192.168.13.220 eth3

Volume Groups (vg00)

iSCSI volumes (lv0000, lv0001)

iSCSI targets

Note: It is strongly recommended to use direct point-to-point (without the switch) connection for the volume replication.

Resources Pools and Virtual IP Addresses:
Node-a 192.168.21.100; iSCSI Target 0
Node-b 192.168.22.100; iSCSI Target 1

Resources Pools and Virtual IP Addresses:
Node-a 192.168.31.100; iSCSI Target 0
Node-b 192.168.32.100; iSCSI Target 1

iSCSI Failover/Volume Replication (eth1)

RAID System 2

Port used for WEB GUI management
eth0 IP:192.168.10.221

Volume Replication ,
Auxiliary connection (Heartbeat)
eth1 IP:192.168.11.221

Storage Client Access, Multipath,
Auxiliary connection (Heartbeat)
eth2 IP:192.168.12.221

Storage Client Access, Multipath
Auxiliary connection (Heartbeat)
eth3 IP:192.168.13.221

Volume Groups (vg00)

iSCSI volumes (lv0000, lv0001)

iSCSI targets

NOTE:

To prevent switching loops, it's recommended to use RSTP (802.1w) or STP (802.1d) protocol on network switches used to build A-A Failover network topology.

Open-E DSS V7 with Multipath Active-Active iSCSI Failover



1. Hardware Configuration

Storage client 1

IP:192.168.0.101 eth0

IP:192.168.21.101
IP:192.168.22.101 eth2 (MPIO)

IP:192.168.31.101
IP:192.168.32.101 eth3 (MPIO)

Storage client 2

eth0 IP:192.168.0.102

eth2 (MPIO) IP:192.168.21.102
IP:192.168.22.102

eth3 (MPIO) IP:192.168.31.102
IP:192.168.32.102

PING NODES
IP Addresses : 192.168.1.107, 192.168.2.107

Switch 1

Switch 2

RSTP/Port Trunk

Note: Please use external tool to monitor failures in connections between switches.

Data Server (DSS1)
node-a
IP Address:192.168.0.220

open-e

RAID System 1

Port used for WEB GUI management
IP:192.168.0.220 eth0

Storage Client Access, Multipath
Auxiliary connection (Heartbeat)
bond0 IP:192.168.1.220 (eth1, eth2)

Storage Client Access, Multipath
Auxiliary connection (Heartbeat)
bond1 IP:192.168.2.220 (eth3, eth4)

Volume Replication,
Auxilliary connection (Heartbeat)
IP:192.168.5.220 eth5

Volume Groups (vg00)

iSCSI volumes (lv0000, lv0001)

iSCSI targets

Data Server (DSS2)
node-b
IP Address:192.168.0.221

open-e

RAID System 2

Port used for WEB GUI management
eth0 IP:192.168.0.221

Storage Client Access, Multipath
Auxiliary connection (Heartbeat)
(eth1, eth2) IP:192.168.1.221 bond0

Storage Client Access, Multipath,
Auxiliary connection (Heartbeat)
(eth3, eth4) IP:192.168.2.221 bond1

Volume Replication ,
Auxilliary connection (Heartbeat)
eth5 IP:192.168.5.221

Volume Groups (vg00)

iSCSI volumes (lv0000, lv0001)

iSCSI targets

Resources Pools and Virtual IP Addresses:
Node-a 192.168.21.100; iSCSI Target 0
Node-b 192.168.22.100; iSCSI Target 1

Resources Pools and Virtual IP Addresses:
Node-a 192.168.31.100; iSCSI Target 0
Node-b 192.168.32.100; iSCSI Target 1

Note:
It is strongly recommended to use direct point-to-point and if possible 10Gb connection for the volume replication. Optionally Round-Robin-Bonding with 1Gb or 10Gb ports can be configured for the volume replication. The volume replication connection can work over the switch, but the most reliable is a direct connection.

iSCSI Failover/Volume Replication (eth5)

NOTE:
To prevent switching loops, it's recommended to use RSTP (802.1w) or Port Trunking on network switches used to build A-A Failover network topology.

Open-E DSS V7 with Multipath Active-Active iSCSI Failover



Storage client 1

IP:192.168.0.99 eth0

IP:192.168.21.99
IP:192.168.22.99 eth1, eth2 (MPIO)

IP:192.168.31.99
IP:192.168.32.99 eth3, eth4 (MPIO)

Storage client 2

eth0 IP:192.168.0.101

eth1, eth2 (MPIO) IP:192.168.21.101
IP:192.168.22.101

eth3, eth4 (MPIO) IP:192.168.31.101
IP:192.168.32.101

PING NODES
IP Addresses : 192.168.1.107,
192.168.2.107

Data Server (DSS1)
node-a

RAID System 1

Port used for WEB GUI management
IP:192.168.0.221 eth5

Storage Client Access, Multipath
Auxiliary connection (Heartbeat)
bond0 IP:192.168.1.221 (eth1, eth2)

Storage Client Access, Multipath
Auxiliary connection (Heartbeat)
bond1 IP:192.168.2.221 (eth3, eth4)

Volume Replication,
Auxilliary connection (Heartbeat)
IP:192.168.5.221 eth0

Volume Groups (vg00)

iSCSI volumes (lv0000, lv0001,
lv0002, lv0003)

iSCSI targets

Switch 1

RSTP/Port Trunk

Switch 2

Note: Please use external tool to monitor failures in connections between switches.

Resources Pools and Virtual IP Addresses:
Node-a 192.168.21.100; iSCSI Target 0,2
Node-b 192.168.22.100; iSCSI Target 1,3

Resources Pools and Virtual IP Addresses:
Node-a 192.168.31.100; iSCSI Target 0,2
Node-b 192.168.32.100; iSCSI Target 1,3

Note: It is strongly recommended to use direct point-to-point and if possible 10Gb connection for the volume replication. Optionally Round-Robin-Bonding with 1Gb or 10Gb ports can be configured for the volume replication. The volume replication connection can work over the switch, but the most reliable is a direct connection.

iSCSI Failover/Volume Replication (eth0)

Data Server (DSS2)
node-b

RAID System 2

Port used for WEB GUI management
eth5 IP:192.168.0.223

Storage Client Access, Multipath
Auxiliary connection (Heartbeat)
(eth1, eth2) IP:192.168.1.223 bond0

Storage Client Access, Multipath,
Auxiliary connection (Heartbeat)
(eth3, eth4) IP:192.168.2.223 bond1

Volume Replication ,
Auxilliary connection (Heartbeat)
eth0 IP:192.168.5.223

Volume Groups (vg00)

iSCSI volumes (lv0000, lv0001
lv0002, lv0003)

iSCSI targets

NOTE:

To prevent switching loops, it's recommended to use RSTP (802.1w) or Port Trunking on network switches used to build A-A Failover network topology.



Thank you!

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